

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. Claims 38 and 63 have been amended, and no new matter has been added. Accordingly, upon entry of this Amendment and Reply, Claims 38-85 will remain pending in the present application.

Claim Rejections – 35 U.S.C. § 112

On page 2 of the Office Action, Claim 63 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Appropriate correction has been made, and reconsideration and withdrawal of the rejection under 35 U.S.C. § 112 is respectfully requested.

Claim Rejections – 35 U.S.C. §§ 102 and 103

The claims of the present application have been rejected over Klein et al. (US 2003/0013015), alone or in combination with other references. Specifically:

- Claims 38-39, 42-44, 55, 60-62, 64-65, 72, 75-76, and 78-81 were rejected under 35 U.S.C. § 102(b) as being anticipated by Klein et al.;
- Claims 40-41, 45-46, 63, 66, 82-83, and 85 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Klein et al. in view of Bando et al. (US 5,965,295);
- Claims 47-54, 67-71, 77, and 84 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Klein et al. in view of Young et al. (US 6,461,766);
- Claims 57-59 and 74 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Klein et al. in view of Hampden-Smith et al. (US 2003/0054218); and
- Claims 56 and 73 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Klein et al. in view of Bauerlein (US 2002/0042000).

At the outset, Applicants would like to note that the effective filing date of the present application is October 21, 2003, which is the date of filing the parent Norwegian patent

application (the present application claims priority to International Application No. PCT/NO04/00321, which in turn claims priority to Norwegian Application No. 2003 4702). Accordingly, Klein et al. does not qualify as prior art under 35 U.S.C. § 102(b). Applicants assume, however, that the Examiner intended to refer to 35 U.S.C. § 102(e), and will proceed under that assumption for the remainder of this response.

Independent Claim 38 relates to an “electrode” that includes a “first sheet comprising a hydrogen storage material” and a “second sheet” that comprises “a high energy density metal that is configured to act as a hydrogen source for the hydrogen storage material on reaction with electrolyte in the cell, wherein the high energy density metal is mixed with at least one of polytetrafluoroethylene or graphite.”

Independent Claim 61 relates to an “electrochemical cell” that includes an “electrode comprising a first sheet including a hydrogen storage material and a second sheet separate from the first sheet, the second sheet including a high energy density metal that is configured to act as a hydrogen source for the hydrogen storage material on reaction with electrolyte in the cell.”

Independent Claim 82 relates to a “method of producing an electrode” that includes “sintering or forming with a binder a high energy density metal into a first sheet” and “forming a second sheet comprising a hydrogen storage alloy.”

The primary reference relied upon in the Office Action, Klein et al., relates to a “bipolar battery” that includes “electrodes” that are “contained within [a] wafer cell by the use of a first electrically conductive lamination 5 and a second electrically conductive lamination 6” (paragraph [0048]). The laminations 5 and 6 each include an inner metal layer (e.g., layer 7) and a polymeric outer layer (e.g., layer 8). The inner metal layers appear to be provided to form an electrically conductive path from the electrodes to contact points outside the cell (see, e.g., paragraphs [0048] and [0057]-[0058]).

The “metal layers” of the laminations 5 and 6 in Klein et al. are not configured to act as a hydrogen source on reaction with electrolyte within the cell, as recited in independent Claims 38 and 61. Klein et al. notes that the polymeric outer layers are “affixed” to the inner metal layers to form the laminations “by any suitable sealing mechanism which thereby creates a sealed interface” (paragraph [0052]). Thus, three sides of the inner metal layers are sealed to prevent any electrolyte from touching them, with the fourth surface in direct contact with the electrode itself. There is no disclosure, teaching, or suggestion of any interaction between the electrolyte and the metal layers in Klein et al. or of any resulting hydrogen supply by the metal layers. Accordingly, Klein et al. does not disclose, teach, or suggest that the inner metal layers are configured to act as a hydrogen cell for the source or that they are even in contact with the electrolyte.

Further, amended independent Claim 38 recites that the high energy density metal of the second sheet is mixed with at least one of polytetrafluoroethylene or graphite, and independent Claim 82 recites a step of “sintering or forming with a binder a high energy density metal into a first sheet.” The foregoing elements do not appear to be disclosed, taught, or suggested by Klein et al.

The other cited references do not disclose, teach, or suggest the combinations of elements recited in independent Claims 38, 61, or 82, whether taken alone or in combination with Klein et al. or any of the other cited references.

For example, as discussed in the prior response and as admitted by the Examiner on page 12 of the first Office Action, Bando et al. “does not disclose the high energy density [metal] and the hydrogen storage metal are in two separate sheets.” Accordingly, Bando et al., alone or in combination with Klein et al., does not disclose, teach, or suggest a sheet that is separate from a first sheet comprising a hydrogen storage material that is configured to act as a hydrogen source for the hydrogen storage material on reaction with electrolyte in the cell, as required by Claims 38 and 61.

Applicants note that the Examiner relied upon Bando et al. on page 6 of the present Office Action for its alleged teaching of the use of high energy density metal mixed with PTFE and/or graphite. Applicants respectfully disagree with this characterization of the teachings of Bando et al.

Bando et al. discloses in column 7 that the negative electrode is “manufactured by a method wherein a paste comprising an active material for negative electrode, a conductive material, a binder and water is first prepared” and the host matrix for hydrogen is a “hydrogen-absorbing alloy.” On page 6 of the Office Action, the Examiner stated with respect to Bando et al. that “the hydrogen storage material (C7/L32-35) and the high energy density metal (C7/L37) are in contact with each other.” Such a statement mischaracterizes Bando’s teachings. The elements recited in column 7, line 37 are not separate from the “hydrogen-absorbing alloys” of Bando et al. – in fact, these elements are intended as substitutes for a portion of the nickel constituent of the listed hydrogen-absorbing alloys (i.e., the elements such as aluminum aren’t provided on their own, but are actually intended to be part of the hydrogen-absorbing alloys themselves – as such, they can’t act as a hydrogen source for the hydrogen storage material, since they are actually part of the hydrogen storage material). This is clear from a careful reading of Bando et al., which states at column 7, lines 30+ as follows (with underlining added for emphasis):

Examples of the hydrogen-absorbing alloy are LaNi_5 , MmNi_5 , (Mm is a misch metal), LmNi_5 , (Lm represents at least one element selected from the rare earth elements including La), a multi-element system wherein a portion of Ni of the above mentioned compounds is substituted by an element such as Al, Mn, Co, Ti, Cu, Zn, Zr, Cr and B, or TiNi- or TiFe-based alloys. Among them, a hydrogen-absorbing alloy having a general formula, $\text{LmNi}_w\text{Co}_x\text{Mn}_y\text{Al}_z$ (wherein w, x, y and z are number whose total value meets the equation of $5.00 < w + x + y + z < 5.50$) can be preferably employed, since it is capable of suppressing the pulverization thereof in the process of charge/discharge cycle thereby to improve the charge/discharge cycle life of the battery.

Thus, Bando et al. does not disclose, teach, or suggest mixing a “high energy density metal” that is separate from a hydrogen storage alloy with “at least one of polytetrafluoroethylene or graphite,” as recited in Claim 38, or “sintering or forming with a binder a high energy density metal into a first sheet,” as recited in Claim 82.

The remaining references do not cure the deficiencies of Klein et al. and Bando et al., and appear to have been cited only for their alleged teachings of elements recited in various dependent claims.

Accordingly, Applicant submits that the combinations of elements recited in independent Claims 38, 61, and 82 are not disclosed, taught, or suggested by the cited references. Reconsideration and withdrawal of the rejections under 35 U.S.C. § 102 and § 103, and allowance of all pending claims, is therefore respectfully requested.

* * *

It is submitted that each outstanding objection and rejection to the Application has been overcome, and that the Application is in a condition for allowance. The Applicants request consideration and allowance of all pending claims.

It should also be noted that although arguments have been presented with respect to certain claims herein, the recited subject matter as well as various other subject matter and/or combinations of subject matter may be patentable for other reasons. Further, the failure to address any statement by the Examiner herein should not be interpreted as acquiescence or agreement with such statement. The Applicants expressly reserve the right to set forth additional and/or alternative reasons for patentability and/or allowance with the present Application or in any other future proceeding, and to rebut any statement presented by the Examiner in this or other papers during prosecution of the present application.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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